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know the index of refraction of solid gelatine. As I failed to find the value in any book of constants to which I had access I proceeded to make the determination. I took a 90° totally reflecting prism of flint glass and on the long face dropped a few drops of the purest gelatine I could buy—dissolved in warm water. The liquid gelatine spread out and formed two disks of the gelatine about the size and thickness of silver dimes. I then laid the prism away for the gelatine to dry and harden, expecting to determine its index by determining the critical angle of glass-gelatine. But when I examined the prism a few days later I found it ruined. The gelatine had dried out and contracted, and had clung to the glass with such tenacity that some of the glass had been torn from the remainder of the glass—all the way around the circumference of the gelatine disks, forming an annular cavity with .01 cm. to .1 cm. deep.

This experiment proves, in this instance at least, that the cohesive and contractile forces of gelatine, and the adhesion of gelatine for flint glass are greater than the cohesion of the glass. It proves more, for consider the relatively enormous force that must be exerted to pull a piece, say a disk of glass, from (out of) a large plane-faced block of glass where one must take into account the forces about the edge of the disk as well as those on its faces.

I have lately repeated the experiment, using pieces of window glass instead of the prism. Several times the gelatine disks on drying sprung loose from the glass without injuring the surface. However, on taking extra precautions to have the glass surfaces clean, the gelatine prepared in a clean vessel, and very little water used in dissolving it, patches of glass were pulled off by the gelatine drying and springing up around the edge of the disk.

An unsuccessful attempt was made to measure the tenacity of solid gelatine, unsuccessful because of the difficulty in getting a sample free from internal strain. Further experiments are in progress.

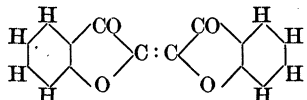
ARTHUR L. FOLEY.

PHYSICS LABORATORY,
INDIANA UNIVERSITY,
April, 1906.

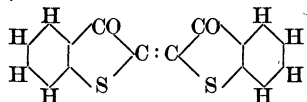
NOTES ON ORGANIC CHEMISTRY.

NEW ANALOGUES OF INDIGO.

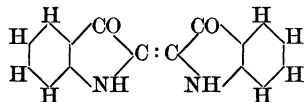
THE importance of indigo in the arts is so great that considerable general interest attends the discovery of related compounds. Some years ago P. Friedländer and J. Neudoeffer¹ prepared a compound which they believed to be represented by the formula,



Friedländer has now confirmed this result² and has also obtained the corresponding thio-derivative,



On comparing these formulæ with that of indigo,



it will be observed that the two new compounds are to be regarded as indigo in which the bivalent imino (NH) group is replaced by an equivalent atom of oxygen and sulphur, respectively.

Oxygen-indigo, as the first compound may be termed, is a red dye which is much more rapidly acted on by light than indigo. Its preparation is attended with considerable difficulty.

Thioindigo, on the other hand, can be obtained with comparative ease from thiosalicylic acid. It also is a red, sparingly soluble dye, crystallizing in brown-red needles with a bronze luster. Its chloroform solution is red, with a shade of blue, and it exhibits a strong yellowish-red fluorescence and a characteristic absorption spectrum. At high temperatures thioindigo is more stable than indigo and may be sublimed and distilled. Thioindigo resembles indigo in its behavior with acids, re-

¹ *Ber. d. Chem. Ges.*, **32**, 1867 (1899).

² *Ibid.*, **39**, 1060 (1906).

ducing and oxidizing agents, but goods dyed with it surpass those dyed with indigo in their stability to light and resistance to oxidation. It is, as yet, uncertain whether thio-indigo will have any technical value.

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RECENT MUSEUM REPORTS.

IN reading the *Report of the U. S. National Museum* for 1903-1904 one is struck with the liberality displayed in permitting the use of material and in publishing the results of the labors of others than its regular staff. The bibliography of papers based in whole, or in part, on its collections contains some eighty names. Much is done for the public at large in the way of furnishing information and identifying specimens. Perhaps these may be among the causes that have delayed the publication of the report for something over a year and a half, although the report proper was issued as a separate in 1905. Owing to this delay we have an account of the commencement of work on the new museum building when the basement story is now largely built. In view of the cramped quarters occupied at present and the need of extensive repairs to the roof of the old museum building it is to be hoped that work may progress rapidly. Among the more important accessions noted are ethnological and zoological collections from the Malay Archipelago and Philippines, obtained by Dr. W. L. Abbott and Dr. E. A. Mearns. The most extensive additions are in the departments of botany and entomology, the rapid growth of the latter department during the past few years making the collection of insects one of the most important in the world; the collection of musical instruments is also in the foremost rank. This in spite of the fact that the museum has always been sadly hampered in obtaining desirable specimens by the small appropriation—\$10,000—for their purchase. Even this paltry sum (paltry for a national institution) less than some museums pay for a single object, was struck out of the appropriation for 1905.

Attention is called to the smallness of the museum staff in comparison with the work

required of them, and it may also be said that this is all the greater owing to the comprehensive scope of the museum collections. There are those who believe that this is greater than any one museum can justly cover, and consider that a readjustment of the collections to form at least three separate museums would be advantageous and result in better support by congress.

As usual the report includes papers based on the collections or work of the museum. This year there are only three such articles, but one, 'Contributions to the History of American Geology,' by George P. Merrill, is a book in itself, giving a consecutive history of the rise and progress of geology in this country from 1785 to 1879. Furthermore, there are chapters on the 'Fossil Footprints of the Connecticut Valley,' 'The Eozoon Question,' 'The Laramie Question' and 'The Taconic Question.' There are portraits of many, if not most, of the well-known geologists of the United States, the whole forming a most important, much-needed, and, withal, readable work.

The *Annual Report of the Director of the Field Columbian Museum* for 1904-1905 marks the steady progress of this institution, not the least important event being the consideration of the plans for a new building. It is to be earnestly hoped that this may be commenced without further delay to furnish proper housing for the collections.

Important accessions are noted, especially by purchase, this being a most satisfactory way in which to acquire specimens since only those are obtained that are needed; many minerals, botanical and ethnological objects were secured in this way. No less than thirteen field parties were sent out during the year, the expedition to the Bahamas resulting in many additions to the herbarium, while the department of geology secured important material from the White River Beds, including skulls of *Brontops*, *Hyracodon*, *Aceratherium* and various creodonts. From the results of collecting in former years one fine skull of *Triceratops* has been prepared and placed on exhibition and another partially worked out.